

AMENDMENT TO THE CLAIMS

1. (Withdrawn) A circularly polarized single-feed microstrip resonant sensor for the purpose of measuring a sample dielectric property.
2. (Withdrawn) The sensor in claim 1 that measures sample dielectric properties with a fixed air gap between the sensor and the sample.
3. (Withdrawn) The sensor in claim 1 that measure samples dielectric properties within  $2.5 \lambda$  of the sensor.
4. (Withdrawn) The sensor in claim 1 that measure sample dielectric properties within  $2.5 \lambda$  of the sensor and with a fixed air gap between the sensor and the sample.
5. (Currently Amended) A single-feed microstrip resonant sensor device comprising:
  - a container having a material within the container to be measured;
  - a microwave source;
  - an antenna having a plurality of resonant modes couples to the source, the antenna generating a signal having a plurality of polarization components that is transmitted through the container, and the antenna being spaced from the material within the container with an air gap to measure a dielectric property of the material; and
  - a phase detection circuit and a magnitude detection circuit coupled to the sensor device.

6. (Previously Presented) The sensor of claim 5 wherein the air gap between the antenna and the material is defined by a radome.
7. (Previously Presented) The sensor of claim 5 wherein the air gap has a spacing within  $2.5 \lambda$  of the sensor.
8. (Previously Presented) The sensor of claim 5 wherein the antenna comprises a flat rectangle.
9. (Withdrawn) A circularly polarized, dual-feed microstrip resonant sensor that measures sample dielectric properties.
10. (Withdrawn) The sensor in claim 9 that measures sample dielectric properties with a fixed air gap between the sensor and the sample.
11. (Withdrawn) The sensor in claim 9 that measures dielectric properties within a  $2.5 \lambda$  of the sensor.
12. (Withdrawn) The sensor in claim 9 that measures sample dielectric properties within  $2.5 \lambda$  of the antenna and with a small, consistent air gap between the antenna and the sample.
13. (Withdrawn) A two feed microstrip resonant sensor where one feed excites a horizontal mode of the sensor and the other feed independently excites a vertical mode of the sensor and both modes are at the same resonant frequency.

14. (Withdrawn) The sensor in claim 13 that measures sample dielectric properties with a fixed air gap between the antenna and the sample.
15. (Withdrawn) The sensor in claim 13 that measures sample dielectric properties within  $2.5 \lambda$  of the sensor.
16. (Withdrawn) The sensor in claim 13 that measures sample dielectric properties within  $2.5 \lambda$  of the antenna and with a fixed air gap between the antenna and the sample.
17. (Withdrawn) A two feed microstrip resonant sensor wherein one feed excites a horizontal mode of sensor and the other feed independently excites the vertical mode of the sensor and both modes are at a difference resonant frequency.
18. (Withdrawn) The sensor in claim 17 that measures sample dielectric properties with a small but fixed air gap between the sensor and the sample.
19. (Withdrawn) The sensor in claim 17 that measures sample dielectric properties within  $2.5 \lambda$  of the sensor.
20. (Withdrawn) The sensor in claim 17 that measures sample dielectric properties within  $2.5 \lambda$  of the sensor and with a fixed air gap between the sensor and the sample.

21. (Withdrawn) A multi-feed ( $N > 2$ ) microstrip resonant sensor wherein the difference feeds primarily excite one of the many modes of the resonant sensor and all modes are the same frequency.
22. (Withdrawn) The sensor in claim 21 that measures sample dielectric properties with a fixed air gap between the sensor and the sample.
23. (Withdrawn) The sensor in claim 21 that measures sample dielectric properties within  $2.5 \lambda$  of the sensor.
24. (Withdrawn) The sensor in claim 21 that measures sample dielectric properties within  $2.5 \lambda$  of the sensor and with a fixed air gap between the antenna and the sample.
25. (Withdrawn) A multi-feed ( $N > 2$ ) microstrip resonant sensor wherein the difference feeds primarily excite one of a plurality of modes of the resonant sensor and all modes are at different frequencies.
26. (Withdrawn) The sensor in claim 25 that measures sample dielectric properties with a fixed air gap between the sensor and the sample.
27. (Withdrawn) The sensor in claim 25 that measures sample dielectric properties within  $2.5 \lambda$  of the sensor.

28. (Withdrawn) The sensor in claim 25 that measures sample dielectric properties within  $2.5 \lambda$  of the antenna and with a fixed air gap between the sensor and the sample.
29. (Withdrawn) A multi-feed ( $N > 2$ ) microstrip resonant sensor wherein the difference feeds primarily excite one of many modes of the resonant sensor and some modes share difference resonant frequencies.
30. (Withdrawn) The sensor in claim 29 that measures sample dielectric properties with a fixed air gap between the sensor and the sample.
31. (Withdrawn) The sensor in claim 29 that measures sample dielectric properties within  $2.5 \lambda$  of the sensor.
32. (Withdrawn) The sensor in claim 29 that measures sample dielectric properties within  $2.5 \lambda$  of the sensor and with a fixed air gap between the sensor and the sample.
33. (Withdrawn) The sensor of Claim 29 further comprising drive circuitry to detect the individual polarization to make dielectric measurements.
34. (Withdrawn) The sensor of Claim 29 further comprising a fixed air gap between the resonant dielectric sensor and the sample under test.

35. (Withdrawn) The sensor in Claim 29 further comprising a fixed air gap enforced with a dielectric radome to separate a resonant dielectric sensor from the sample.
36. (Withdrawn) A method of using phase information to detect a resonance frequency of a resonant dielectric sensor.
37. (Withdrawn) A method of using a microstrip dielectric resonant sensor to determine bottle contents.
38. (Withdrawn) A method of using a microstrip dielectric resonant sensor to determine container contents.
39. (Withdrawn) A method of using a microstrip dielectric resonant sensor to determine mixture ration of materials in a free-standing container.
40. (Previously Presented) The device of claim 5 wherein the container comprises a bottle.
41. (Previously Presented) The device of claim 40 wherein the bottle contains a fluid to be measured.
42. (Previously Presented) The device of claim 5 wherein the antenna is circularly polarized.
43. (Previously Presented) The device of claim 5 wherein a first resonant mode has a first frequency and a second resonant

mode has a second frequency difference from the first frequency.

44. (Previously Presented) The device of claim 5 further comprising a directional coupler between the source and the antenna.
45. (Previously Presented) The device of claim 5 further comprising a data processor connected to the phase detection circuit and the magnitude detection circuit.